

An “Atomic Garbage Dump” for Kansas



Underground Vaults and Storage, Inc., salt mines, Hutchinson, Kansas, early 1960s.

In the early 1970s an abandoned salt mine in Lyons, Kansas, received serious consideration as a site for disposing of high-level radioactive waste materials from nuclear weapons production and commercial nuclear power. The U.S. Atomic Energy Commission (AEC)—the federal agency responsible for building nuclear weapons, promoting peaceful uses of nuclear power, and ensuring nuclear safety—faced strong pressure to find a satisfactory location for storing radioactive waste. As a result, it moved rapidly to investigate the suitability of the Lyons site and make preparations to develop it as the nation’s first high-level waste repository. In the process, it provoked growing opposition from scientists and politicians in Kansas, who complained that the agency failed to fully explore vital technical issues. The AEC’s efforts

The Controversy over the Lyons Radioactive Waste Repository, 1970–1972

by J. Samuel Walker

eventually collapsed on both political and technical grounds; it not only took actions that antagonized key leaders in Kansas but also found that the Lyons site was inappropriate for burying radioactive waste.

The AEC had confronted the problem of radioactive waste from the time it began operations in 1947. It inherited large quantities of waste from the atomic weapons plants that had been constructed during World War II, especially at Hanford, Washington, and Oak Ridge, Tennessee, and it created even greater amounts in new plants built during the early Cold War years. The most hazardous form of waste was the highly radioactive liquids that were a by-product of “reprocessing” uranium fuel from a reactor to recover plutonium. The AEC stored such high-level liquids in underground tanks at its own plants while it sought a permanent means to dispose of them.¹

Radioactive waste posed a grave danger if it entered the environment in sufficient quantity and intensity to threaten public health. The AEC pointed out that small releases of radiation from waste were unavoidable, but agency officials were confident that their procedures did not allow occupational or public exposures that exceeded the “permissible limits” recommended by scientific authorities. AEC officials were keenly aware of the importance of finding satisfactory long-term means for disposing of radioactive waste, both for the protection of public health and for the future development of the nuclear power industry. The AEC devoted considerable effort to identifying the most promising approaches for isolating nuclear waste materials from the environment for hundreds, and in some cases thousands, of years. By the early 1960s the prevailing view among experts was that the best method for disposal of high-level waste was to immobilize liquids in a solid form and then place the solid waste in an appropriate geological site.²

The problem of radioactive waste attracted little popular interest in the first decade after World War II. The public became increasingly concerned about waste disposal, however, after a spirited controversy over radioactive fallout from nuclear weapons testing made radiation hazards a prominent subject in news reports, magazine stories, political campaigns, and congressional hearings. Scientific experts disagreed sharply about the extent of the risk presented by exposure to fallout, and the highly publicized and sometimes acrimonious debate clearly intensified public anxieties about radiation. One result was an outcry over the dumping of low-level radioactive waste into deep ocean waters in the late 1950s. The materials that the AEC authorized for sea burial were far less radioactive and much less dangerous than high-level liquid waste. But a barrage of criticism persuaded the agency that it should not grant new licenses for ocean disposal. The uproar provided unmistakable evidence of public misgivings about waste disposal practices and drew unprecedented notice to the issue. *Consumer Reports*, for example, ran a story in February 1960 that discussed the “huge and ever-increasing problem of radioactive waste.”³

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1. Roy E. Gephart, *Hanford: A Conversation About Nuclear Waste and Cleanup* (Columbus, Ohio: Battelle Press, 2003), chaps. 1, 5; Michele Stenehjem Gerber, *On the Home Front: The Cold War Legacy of the Hanford Nuclear Site* (Lincoln: University of Nebraska Press, 1992), chaps. 2–6; Terrence R. Fehner and F. G. Gosling, “Coming in from the Cold: Regulating U.S. Department of Energy Facilities, 1942–96,” *Environmental History* 1 (April 1996): 5–33.

2. Joseph A. Lieberman, “Nuclear Energy Industrial Wastes,” January 27, 1960, box 2261 (MAT-12, Radioactive Waste and Waste Disposal), Office Files of John A. McCone, RG 326 (Records of the Atomic Energy Commission), National Archives, College Park, Md. (hereafter AEC Records); George T. Mazuzan and J. Samuel Walker, *Controlling the Atom: The Beginnings of Nuclear Regulation, 1946–1962* (Berkeley: University of California Press, 1984), 345–352.

3. “The Huge and Ever-Increasing Problem of Radioactive Wastes,” *Consumer Reports* 25 (February 1960): 66–67; Mazuzan and Walker, *Controlling the Atom*, 355–372.

Kansas History: A Journal of the Central Plains 27 (Winter 2006–2007): 266–285

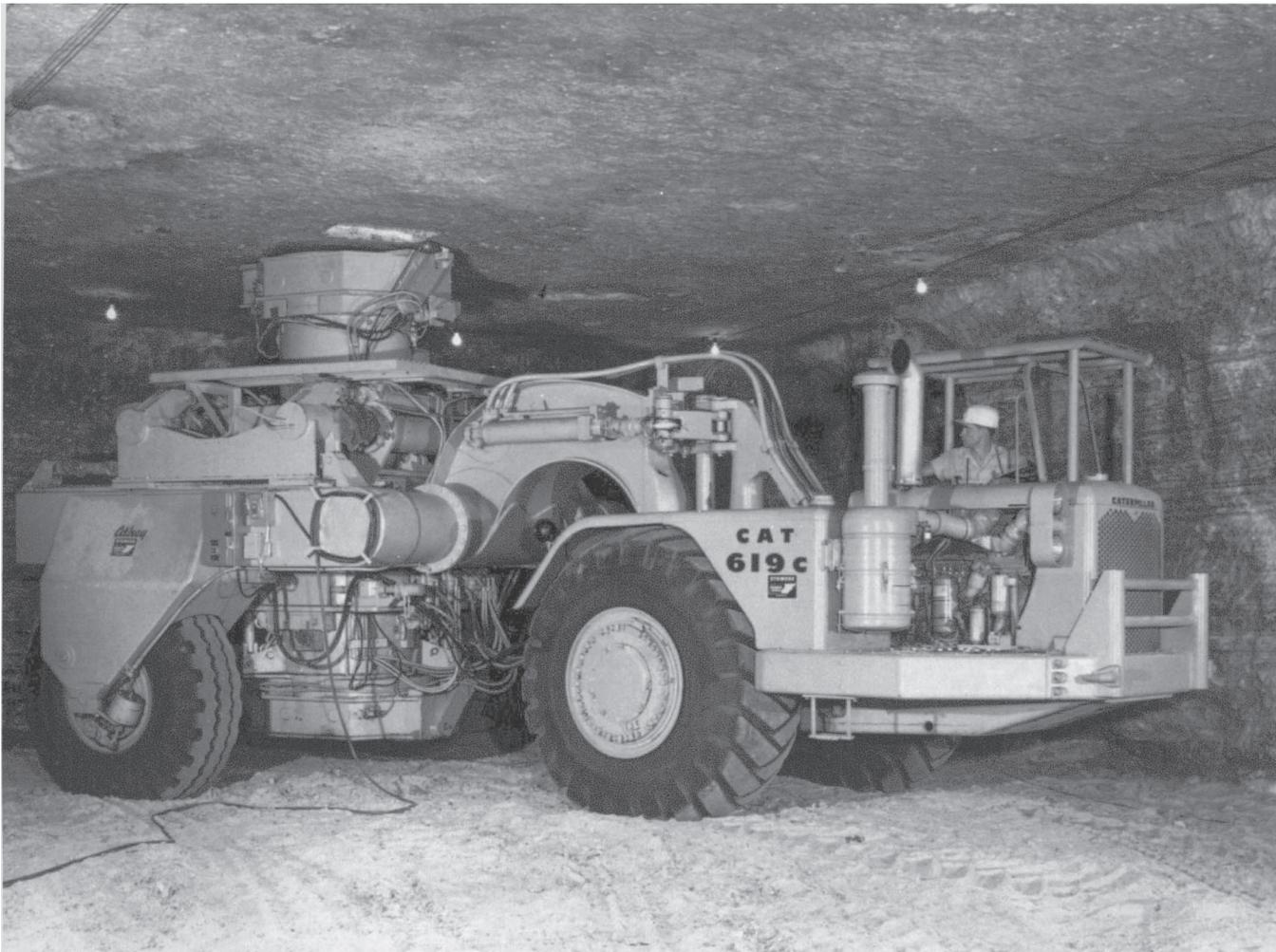


Project Salt Vault, as the Lyons study was called, commenced in the fall of 1965 and lasted until January 1968. Here researchers conduct tests on fuel assemblies buried in a salt mine.

The AEC was satisfied that it was making steady progress toward a solution to the waste problem, but its search for a suitable disposal site became increasingly urgent because of two developments in the late 1960s. The first was a controversy surrounding the handling of waste at the National Reactor Testing Station, an AEC-funded facility in Idaho. State officials, responding to protests from citizens, raised questions about the AEC's management of high-level waste and long-lived, low-intensity "transuranic elements" (such as plutonium) at the Idaho site. They expressed concern that radioactivity from the waste could reach the Snake River Plain Aquifer and contaminate the state's water supplies. In June 1970, after the issue generated headlines both locally and nationally, the AEC promised Idaho Senator Frank Church that it would move waste materials out of

the state to a permanent site. At the same time that it made its commitment to Church, the AEC was seeking a location for high-level waste from the commercial nuclear power industry, which had experienced an unexpected boom during the late 1960s. The expansion of commercial nuclear power soon triggered a sharply contested national debate over the safety of the technology. One prominent issue cited by critics was nuclear waste, and their arguments placed additional pressure on the AEC to find a solution promptly.⁴

4. *Journal of Glenn T. Seaborg*, 25 vols. (Berkeley: Lawrence Berkeley National Laboratory, PUB-625, 1989), vol. 22, 55, 239-240 (available in the Glenn T. Seaborg Papers, Manuscript Division, Library of Congress, Washington, D.C.); *Congressional Record*, 91st Cong., 2nd sess., 1970, 6295-6298; J. Samuel Walker, *Containing the Atom: Nuclear Regulation in a Changing Environment, 1963-1971* (Berkeley: University of California Press, 1992), 18-36, 387-414.



A “transporter” used to move fuel assemblies during Project Salt Vault. It received canisters from the surface through a shaft and carried them to the holes in the floor of the salt mine. The trailer was heavily shielded to protect the driver from exposure to radiation.

The AEC had been investigating permanent disposal of high-level waste since the 1950s. In 1957 the National Academy of Sciences’ Committee on Waste Disposal, which had been established at the request of the AEC, published a report in which it concluded that salt formations offered the most promising geological setting for high-level liquid radioactive waste. It based its view on the dry, impermeable, and “self-sealing” properties of salt deposits. The plasticity of salt made it likely to seal fractures that might occur and to block the penetration of liquids. The committee also pointed out that salt formations were abundant, generally located in areas of low seismic activity, and inexpensive to mine. It called for research to address technical uncertainties. Accordingly, the AEC made

arrangements to conduct preliminary experiments in an unused section of a salt mine owned by the Carey Salt Company in Hutchinson, Kansas. Although there were large salt deposits in other parts of the United States, including sections of New York and Michigan, the agency found central Kansas especially inviting because the size, thickness, and depth of the formations within the state best met its siting criteria.⁵

5. Joseph A. Lieberman to Frank Foley, December 22, 1958, box 26 (AEC Oak Ridge, Salt Vault Hutchinson), series 1, Subject Files (Salt Vault: Atomic Energy Commission), RG 37 (Records of the Kansas State Geological Survey), University Archives, Spencer Research Library, University of Kansas, Lawrence (hereafter Kansas Geological Survey Records); Morse Salisbury to James T. Ramey, October 19, 1959, box 705 (Waste Disposal), General Correspondence, Papers of the Joint Committee on Atomic En-



As early as 1959, Kansans such as Senator Andrew F. Schoeppel, a former Republican governor from Ness City—flanked here by Vice President Richard M. Nixon (left) and President Dwight D. Eisenhower—sounded the alarm with regard to the issue of radioactive waste disposal. During his 1960 reelection campaign the senator “stressed his opposition to the use of the mine caverns for atomic waste deposits because it isn’t absolutely certain the wastes will not endanger the region” (Lyons Daily News, October 14, 1960).

Between 1959 and 1961 scientists from Oak Ridge National Laboratory, which was operated by the Union Carbide Corporation under an AEC contract, ran a series of experiments in the Hutchinson mine. They injected nonra-

dioactive liquids that simulated the heat produced by nuclear waste into cavities drilled in the floor of the mine. The results of their work were encouraging but not conclusive. In July 1963 the AEC announced that Oak Ridge would conduct a new battery of tests in an abandoned salt mine in Lyons that was also owned by the Carey Salt Company. Unlike the Hutchinson tests, the Lyons study, named Project Salt Vault, would use solid radioactive waste in the form of fuel elements from the National Reactor Testing Station.⁶

ergy, RG 128 (Records of the Joint Committees of Congress), National Archives, Washington, D.C. (hereafter Joint Committee on Atomic Energy Papers); *The Disposal of Radioactive Waste on Land* (Washington: National Academy of Sciences–National Research Council, 1957), 4–5, 134–138; F. M. Empson, ed., *Status Report on Waste Disposal in Natural Salt Formations: III (ORNL-3053)* (Oak Ridge National Laboratory, September 11, 1961); W. C. McClain and R. L. Bradshaw, “Status of Investigations of Salt Formations for Disposal of Highly Radioactive Power-Reactor Wastes,” *Nuclear Safety* 11 (March–April 1970): 130–140; Joint Committee on Atomic Energy, *Hearings on AEC Authorizing Legislation Fiscal Year 1972*, 92nd Cong., 1st sess., 1971, 1503, 1525.

6. Committee on Waste Disposal, Minutes of Meeting of May 14, 1960, Accession 79-032-2 (Minutes–Geologic Aspects of Radioactive Waste Disposal, Advisory to AEC), National Academy of Sciences–National Research Council Archives, Washington, D.C.; AEC Press Release, July 9,

Great Bend Daily Tribune,
November 18, 1963

The Salt Vault tests were performed between November 1965 and January 1968. Their purpose was to provide information on several crucial issues, including the design of equipment and methods to move high-level waste from a nuclear plant site to a permanent repository, the effects of radiation on salt, and the extent to which elevated temperatures would cause "creep and plastic flow" in salt formations. The concern was that "thermal stress" would increase the flow of salt in a way that undermined the mine's structural stability. During the Project Salt Vault experiments, the intensely radioactive fuel assemblies, packed in canisters, were lowered into steel-lined shafts that extended about twelve feet below the floor of the mine, which was about one thousand feet underground. Over a period of nineteen months, the salt closest to the shafts received a massive (by human health standards) average radiation dose.⁷

The researchers who carried out Project Salt Vault found the results to be "most encouraging." They believed that the tests went a long way toward confirming the feasibility of placing radioactive waste in salt formations. In early 1970 they reported that "most of the major technical problems pertinent to the disposal of highly radioactive waste in salt have been resolved." The Oak Ridge experts concluded that high-level waste could be safely handled in an "underground environment," that "the stability of salt under the effects of heat and radiation has been shown," and that the problem of salt creep could be managed by a "suitable design" for the repository.⁸

The Project Salt Vault findings came at an opportune time for the AEC, which was then under fire from Senator Church over waste at the National Reactor Testing Station. On March 6, 1970, AEC Chairman Glenn T. Seaborg noted in his diary, after receiving a briefing from Oak Ridge officials, that the results of the Lyons tests were "very encouraging." This assessment enabled the AEC to offer as-

1963, box 706 (Waste Disposal), General Correspondence, Joint Committee on Atomic Energy Papers.

7. W. G. Belter, W. McVey, C. B. Bartlett, K. L. Mattern, and W. H. Reagan, "The AEC's Position on Radioactive Waste Management," *Nuclear News* 12 (November 1969): 60-65; R. L. Bradshaw, F. M. Empson, W. C. McClain, and B. L. Houser, "Results of a Demonstration and Other Studies of the Disposal of High Level Solidified, Radioactive Wastes in a Salt Mine," *Health Physics* 18 (January 1970): 63-67; McClain and Bradshaw, "Status of Investigations," 130-141.

8. Bradshaw et. al., "Results of a Demonstration," 67; McClain and Bradshaw, "Status of Investigations," 140.

Editorial Page

Underground Dump

Atomic Energy Commissioners' remarks about storing waste materials in salt caverns located 1,000 feet below Lyons, have caused murmurs of discontent. People are just plain scared of anything that has to do with nuclear fission.

It won't do AEC much good to try and salve Rice Countians' feelings with comments about how utterly safe the stuff is, because even the federal government is taking nary a chance of having its workers glowing in the dark like watch dials.

From what we've been able to comprehend, handling of fissionable materials is even more hazardous than defusing land mines and allied lethal gimmicks. Whereas, one slip with a screwdriver will send a "sapper" to the hereafter in a glorious blast, the radioactive AEC worker can expect to slowly disintegrate while isolated from his fellows. His death may be less spectacular than the defuser's, but the end result is identical.

urances to Church that it would transfer the Idaho waste to a permanent repository that it hoped to open within a decade. Meanwhile, the AEC staff began working on a plan for the acquisition of land and construction of a salt mine facility in central Kansas for high-level and transuranic waste. Although it described the prospective installation as a "demonstration project," it predicted that "the facility would ultimately be designated as the initial Federal radioactive waste repository." The probable site was the Carey mine in Lyons, both because it had "extensive exist-

ing workings" from Project Salt Vault and because it would allow the "earliest possible start" for permanent disposal. The staff had held discussions with "principal officials" in Kansas that seemed to "indicate support for locating the proposed waste facility in the Kansas salt beds."⁹

Despite the AEC staff's optimistic appraisal of local opinion, the investigations of salt mines for disposal of radioactive waste elicited mixed reactions in Kansas. Some Kansans had expressed concern as soon as Oak Ridge had begun its first field tests in Hutchinson. On June 11, 1959, Senator Andrew F. Schoepfel cited an "alarming situation" that could produce "disastrous results" in Kansas. He was under the erroneous impression that the Hutchinson tests involved pouring high-level liquid radioactive waste directly into salt mines, and he warned his constituents that they could not be "absolutely certain" about the safety of such procedures. In November 1963 an editorial in the *Great Bend Daily Tribune* took a similar position. It commented that announcements about Project Salt Vault "caused murmurs of discontent" because "nobody is too wild about having atomic energy bubbling under his back yard."¹⁰

Other Kansans, by contrast, strongly supported the AEC's projects. In 1962 Frank C. Foley, director of the Kansas Geological Survey, commented that there was "great interest" among state officials in the potential advantages of a waste disposal facility in Kansas. He cautioned, however, that the "psychology of informing the public" was "of great significance." He suggested that the term "atomic waste disposal" was "not good psychology," and argued that it should be replaced by "atomic by-products storage."¹¹

The citizens of Lyons offered a warm reception to Project Salt Vault and, from all indications, generally favored the construction of a permanent repository if the site turned out to be suitable. In early 1970, as rumors circulated that the AEC would settle on Lyons for its demonstration project, an informal poll indicated that most residents approved development of the installation or "were little concerned one

way or the other." John Sayler, editor of the *Lyons Daily News*, believed that his neighbors were "overwhelmingly for it." Lyons was a town of about 4,500 people, located in central Kansas about sixty-five miles northwest of Wichita. One reporter described it as a "placid, pleasant town ... with tree-lined, cobblestone streets in a region where trees are not generally plentiful." Lyons was primarily an agricultural community, but a large mine operated by the American Salt Corporation was an important source of employment. The smaller Carey Salt Company mine, the site of Project Salt Vault, ran directly under the town. It had opened in 1891 and closed in 1948. A majority of residents hoped that the waste repository would provide new jobs and income in their area.¹²

The prevailing attitude in Kansas as the AEC took preliminary action toward the construction of a waste repository in the spring of 1970 was ambivalence. The *Topeka State Journal* captured this mood by citing, on the one hand, the economic benefits of the "somewhat debatable honor of becoming an atomic garbage dump" and, on the other hand, the need to resolve outstanding safety issues. It affirmed that "Kansas wants to consider this with more than the proverbial grain of salt." The fate of the project depended heavily on the position of Governor Robert B. Docking, and, like many Kansans, he was undecided about how the possible economic advantages should be weighed against the potential safety risks. Docking had spent most of his professional career as a banker before he had been elected governor in 1966 and won reelection two years later. As a Democrat in a heavily Republican state, his success depended largely on his commitment to low taxes and other traditionally Republican doctrines. Docking announced that he would seek a third term in May 1970, and placing a radioactive waste repository in Kansas was a potentially sensitive political issue. On both technical and political grounds, therefore, the governor adopted a wait-and-see posture on the benefits and risks of developing a disposal site.¹³

For technical advice on the still pending Lyons proposal, Docking looked to William W. Hambleton, who held

9. *Journal of Glenn T. Seaborg*, vol. 21, p. 432; AEC 180/81 (April 23, 1970), AEC Records, History Division, U.S. Department of Energy, Germantown, Md.

10. *Congressional Record*, 86th Cong., 1st sess., 1959, 10510; Joint Committee on Atomic Energy, *Hearings on AEC Authorizing Legislation Fiscal Year 1972*, 1314; *Lyons Daily News*, October 14, 1960; *Great Bend Daily Tribune*, November 18, 1963.

11. Frank C. Foley to E. G. Struxness, February 16, 1962, box 26 (AEC Oak Ridge, Salt Vault Hutchinson), series 1, Subject Files (Salt Vault: Atomic Energy Commission), Kansas Geological Survey Records.

12. *Lyons Daily News*, June 5, 1970; *Kansas City Times*, June 25, 1970; *New York Times*, March 11, 1971; *Denver Post*, September 27, 1971; John Sayler, telephone interview by author, January 17, 2006.

13. *Topeka State Journal*, June 9, 1970; Joel Paddock, "Democratic Politics in a Republican State: The Gubernatorial Campaigns of Robert Docking, 1966-1972," *Kansas History: A Journal of the Central Plains* 17 (Summer 1994): 108-123; Homer E. Socolofsky, *Kansas Governors* (Lawrence: University Press of Kansas, 1990), 215-218.

The State Journal

page of opinion

Tuesday Evening, June 9, 1970

The mould of a man's fortune is in his own hands.—Sir Francis Bacon, English philosopher.

We'll want to think this over

Kansas is being given prime consideration in the Atomic Energy Commission's plans to salt away its nuclear wastes in underground chambers.

The disposal vault system is not a very glamorous sounding project. But it may be a \$50 million job, providing employment for as long as five years in construction. Economic value of the installation after it begins operation would be \$1 million a year.

Kansas — somewhere in the Lyons or Hutchinson areas — is reported to be in the front running for the somewhat debatable honor of becoming an atomic garbage dump, for two reasons.

FIRST, A SALT MINE is recommended as the most satisfactory underground storage chest for the waste materials. Such formations are deep and dry, with resealing properties in case of earth fractures.

Second, for maximum safety the AEC wants a location in an area of the United States relatively free of earthquakes, as Kansas historically is.

Meeting those requirements, plus its midway U.S.A. geographical placement, would seem to give the state an excellent

chance — if Kansas wants it.

It is a matter that should be weighed very carefully—which, indeed, the State Board of Health and the governor have indicated they will. The reactor fuel wastes are the most potentially dangerous types, remaining radioactive for thousands of years. Properly handled and stored, they are harmless to their immediate area.

ONE FACTOR to consider is the remote possibility of accident in shipment to the burial site, although the AEC has many years experience in handling such transportation. Atomic wastes now interred in four other locations over the country would be moved to the new salt mine depository.

Learning of the AEC's interest last week, the Board of Health wisely decided to hold up any endorsement of the project until full details are made public. Also, Gov. Robert Docking has asked for scientific studies within the state and a report on such findings, together with a recommendation.

In other words, Kansas wants to consider this with more than the proverbial grain of salt.

a Ph.D. in geology from the University of Kansas and became director of the Kansas Geological Survey just as the Lyons issue was gaining prominence. Hambleton knew Docking on a first-name basis from civic activities in Lawrence and regarded the governor as an exceptionally thoughtful and gracious individual. On April 17, 1970, he outlined the political and technical issues that, in his judgment, required careful consideration. He pointed out that "radioactive waste disposal by anyone, anywhere is today a very sensitive public, political, and environmental issue." Hambleton focused on the technical questions that he believed had not been adequately addressed. Although the AEC had "done very definitive work on the properties of salt under a wide range of pressure and temperature conditions," it had not provided the "very detailed information" that was needed to build a waste repository at a specific location. This could be obtained only by a "very careful drilling program" at the site.¹⁴

As Kansas officials considered a series of questions surrounding the proposed waste facility, the AEC moved ahead with its plans. One step it took was to request that the National Academy of Sciences Committee on Radioactive Waste Management, which had been formed in 1968, appoint a special panel to review the "concept of long-term storage of solid radioactive wastes in salt mines." This subcommittee, called the Panel on Disposal in Salt Mines, included Hambleton among its seven members. At its first meeting in Oak Ridge in May 1970, it heard from John A. Erlewine, who was the coordinator and point of contact for the

In a June 9, 1970, editorial the Topeka State Journal captured the prevailing Kansas mood toward the possible construction of a waste repository by citing, on the one hand, the economic benefits of the "somewhat debatable honor of becoming an atomic garbage dump" and, on the other hand, the need to resolve outstanding safety issues.

14. William W. Hambleton to Robert B. Docking, April 17, 1970, box 41 (Atomic Waste Disposal 1970), Robert Docking Papers, Kansas Collection, Spencer Research Library, University of Kansas, Lawrence (hereafter Docking Papers); William W. Hambleton, *Selected Speeches* (Lawrence: Kansas Geological Survey, 1987), iv-v; William W. Hambleton, interview by author, Lawrence, Kans., July 13, 2005.

AEC's waste disposal programs. Erlewine had received a law degree from Columbia University and joined the AEC as a staff attorney in 1952. He had risen quickly through the ranks of the AEC and was highly regarded as an able administrator and an effective spokesman for agency policies. Erlewine told the members of the Panel on Disposal in Salt Mines that the "Commission believes that sufficient R&D has been performed and that it is now appropriate to construct a repository as soon as possible." He revealed that the AEC would soon ask for congressional funding.¹⁵

After the meeting Hambleton and his staff at the Kansas Geological Survey prepared a detailed discussion of matters that in their minds needed further research. Asserting that existing studies had provided an "oversimplified view of the geology" of the Lyons region, they expressed concern about the "inadequacy of base-line data on water quality and quantity," the presence of oil and gas drill holes in the area, the prospect of "sagging and fracturing" if salt thickness were not uniform, and the possibility of structural weaknesses in geological formations. Hambleton thought that investigating those questions would produce useful data within about six months. After he shared his reservations with his colleagues on the Panel on Disposal in Salt Mines, they agreed to meet in Lawrence on June 16–17, 1970, to review outstanding technical issues.¹⁶

While Hambleton was expressing his misgivings, the AEC continued to push ahead. On June 12, 1970, the staff recommended to the commissioners, who made final decisions on policy issues, that the agency designate Lyons as the site of the demonstration project and take action to acquire the property. Although the staff recognized that additional geological and hydrological studies could "seriously challenge the suitability" of the location, it believed, based on the findings of Project Salt Vault, that the Lyons mine would prove to be "well suited for construction of a long-term facility" for disposal of high-level and transuranic waste. The staff was "reasonably confident" that the project would be

favorably received in Kansas. The commission approved the staff's proposal on June 15. Two days later Erlewine announced the "tentative" plan for the Lyons repository at a press conference in Topeka, Kansas. He estimated that the cost of the work at the site would run to \$25 million and would employ two hundred people, mostly from the Lyons vicinity. He reported that new studies would be conducted to confirm the acceptability of the site and added, "It will be go or no-go in the next six months."¹⁷

A staff member of the AEC's Division of Public Information who traveled to Topeka reported that the agency had done a "good job of handling notifications to state and local officials." But the AEC, in fact, had offended Kansas scientists who were deliberating on the same day in Lawrence over the use of the Lyons site. The meeting included members of the Panel on Disposal in Salt Mines and representatives of Oak Ridge National Laboratory, the AEC, the Kansas Geological Survey, and the Kansas Department of Health. Erlewine had disclosed the tentative selection of Lyons to the press in Topeka without waiting for a report from the conference in Lawrence. Erlewine's announcement came as an unpleasant surprise to Hambleton and his colleagues, who saw it as an indication that the AEC was not taking their views seriously. The AEC had committed a grievous and avoidable blunder. Some staff members, including those who attended, were certainly aware of the meeting. The AEC had apparently experienced a breakdown in internal communications, perhaps from arranging the press briefing with ill-considered haste. It also appeared to suffer from acute tone deafness about the potential impact of its announcement. Erlewine's careful efforts to describe the Lyons decision as tentative were not enough to ease the disenchantment and growing distrust on the part of Kansas officials whose support for the project was vital.¹⁸

15. Cyrus Klingsberg to the Panel on Disposal in Salt Mines, June 10, 1970, and Robert W. Newlin to J. A. Erlewine and D. Donoghue, July 24, 1970, AEC Records, History Division, Department of Energy; *Nucleonics Week*, November 18, 1971; e-mail message from Richard G. Hewlett to the author, March 5, 2005.

16. Klingsberg to Panel on Disposal in Salt Mines, June 10, 1970; William W. Hambleton and Gary F. Stewart to John H. Rust, June 5, 1970, box 27 (Disposal in Salt Panel), series 1, Subject Files (Salt Vault: Atomic Energy Commission), Kansas Geological Survey Records; Hambleton to Robert Docking, June 8, 1970, box 41 (Atomic Waste Disposal 1970), Docking Papers.

17. AEC 180/87 (June 12, 1970), AEC Records, History Division, Department of Energy; AEC Press Release, June 17, 1970, printed in Joint Committee on Atomic Energy, *Hearings on AEC Authorizing Legislation Fiscal Year 1972, 1983–1984*; *Wichita Eagle*, June 18, 1970; *Washington Post*, June 18, 1970; *New York Times*, June 18, 1970

18. Robert W. Newlin to John Harris and Joe Fouchard, June 19, 1970, and Cyrus Klingsberg to the Panel on Disposal in Salt Mines, July 1, 1970, AEC Records, History Division, Department of Energy; William W. Hambleton, "Interim Report of the Kansas Geological Survey on Storage of Radioactive Waste in Salt at Lyons, Kansas," July 7, 1970, printed in Joint Committee on Atomic Energy, *Hearings on AEC Authorizing Legislation Fiscal Year 1972, 1998–2002*. Hambleton and his colleague Ernest E. Angino vividly recalled their disaffection with the AEC over Erlewine's



William W. Hambleton (left), director of the Kansas Geological Survey, talks with Howard J. Carey Jr. (center), president of the Carey Salt Co., and Dale E. Saffels, chairman of the Kansas Advisory Council on Ecology, at a meeting in Lyons.

Although the AEC seemed oblivious to the resentment that Erlewine's announcement had generated, it was keenly aware that an outspoken member of the Kansas congressional delegation, Joe Skubitz, had serious doubts about the Lyons proposal. Skubitz's district did not include Lyons; he represented the southeastern section of Kansas, some two hundred miles away. Nevertheless, he followed the developments surrounding the Lyons project with close and increasingly critical vigilance. Skubitz, whose parents

press conference thirty-five years after it occurred. Ernest E. Angino, interview by author, Lawrence, Kans., July 13, 2005; and Hambleton, interview by author.

had emigrated to Kansas from Slovenia, was a native of the area that he served in Congress. He had worked as a teacher and later as a principal; at the same time, he had earned bachelor's and master's degrees from the local teacher's college (now Pittsburg State University). He later served as an administrative assistant to Senator Andrew Schoeppel and received a law degree from George Washington University in Washington, D.C.

In 1962, after Schoeppel's death, Skubitz won a seat in Congress as a Republican. Like many members of his party, he was deeply suspicious of government bureaucracy and wary of federal incursions into areas traditionally reserved for the states. Skubitz was forthright and occasionally im-

politic in expressing his opinions. As the debate over the Lyons waste repository became increasingly bitter, he publicly denounced one prominent supporter of the project as a “stooge of the AEC.” Skubitz first became interested in the AEC’s plans for Lyons because of his experience with the issue as a member of Schoeppel’s staff. Like Schoeppel, he had gained the false impression that the AEC had intended to conduct experiments in Hutchinson a decade earlier by pouring high-level liquid radioactive waste directly into a salt mine.¹⁹

Skubitz’s flawed memory of the Hutchinson tests made him skeptical of the AEC’s plans for the Lyons repository from the outset. He raised a series of questions with Erlewine in a phone call on April 23, 1970, and received assurances that Project Salt Vault had shown that radioactive waste in Kansas salt deposits “would be in as safe a geologic formation as can be found in the United States.” In subsequent correspondence, Skubitz asked Erlewine about the size of the proposed repository, the amount of waste that would be stored, how it would be cooled, and why Kansas was under consideration rather than other states that had large salt deposits. Erlewine replied promptly and conscientiously, but he did not ease Skubitz’s growing reservations. On June 18, the day after Erlewine’s press conference in Topeka, Skubitz sent a letter to Docking in which he disclosed his “grave doubts about the safety of this project in view of the many differing facts and conflicting opinions.” He argued that “we are being asked to assume unknown risks to make Kansas a nuclear dumping ground for all the rest of the nation.” Skubitz elaborated on his concerns in a twelve-page, single-spaced letter to Seaborg. He complained that although Kansas was “expected to assume the risks of storage of nuclear waste material,” it had not received the “benefits provided by a nuclear power plant” that could at-



The AEC’s John A. Erlewine (left) addresses citizens at meeting in Lyons on July 29, 1970, as Governor Robert B. Docking looks on. This photograph was published the next day in the Topeka Daily Capital.

19. *Wichita Eagle-Beacon*, February 7, 1983; *Pittsburg Morning Sun*, February 6, 2000, September 13, 2000; *Congressional Record*, 92nd Cong., 1st sess., 1971, E2426; Joe Skubitz to W. W. Chandler, June 16, 1971, box 48 (Atomic Waste Disposal 1971), Chet Holifield Papers, University of Southern California, Los Angeles (hereafter Holifield Papers).

tract industry and deliver a “real economic boost to the entire state.”²⁰

20. The correspondence between the AEC and Joe Skubitz is printed in U.S. Atomic Energy Commission, *Environmental Statement: Radioactive Waste Repository, Lyons, Kansas*, WASH-1503, June 1971, Appendix (no page numbers).



Ronald H. Baxter, chairman of the executive council of the Kansas chapter of the Sierra Club, speaks at the July 29, 1970, meeting in Lyons.

S kubit, like Hambleton, raised questions about the safety of the Lyons site but did not categorically reject it. The Kansas chapter of the Sierra Club, a prominent national environmental organization, took a more dogmatic stance. Ronald H. Baxter, a former aide to Docking and the chairman of the chapter's executive council, revealed the day after Erlewine's June 17 press conference that his group opposed the project. "We intend to see that Kansas is not used for such a dump," he declared, "and intend to be successful in halting such action." In light of the reactions to Erlewine's announcement, the AEC decided to address the doubts that had been aired and to explain its position in a public appearance in Lyons.²¹

The meeting, held on July 29, 1970, was attended by more than 150 local citizens. It also attracted about thirty media representatives who were mostly, but not exclusively, from Kansas newspapers and radio and television stations. The session was moderated by Governor Docking, who outlined his cautious approach in his first public statement on the Lyons proposal. While he hoped that the project would provide "economic gains" to the local area and the state, he emphasized that "we do not want new industry in Kansas at the expense of our citizens' health and

welfare." Therefore, Docking withheld support for the Lyons repository until he received the results of the scientific investigations that were under way. Erlewine told the audience that the AEC had the same objectives as the governor. "We sincerely believe this is a good project," he said, "but we, too, want to see the studies completed." He estimated that if the assessments were favorable, the site could open for high-level waste in 1975.²²

The National Academy of Sciences Committee on Radioactive Waste Management submitted its evaluation of safety at the Lyons site to the AEC in November 1970. It drew on the findings of the Panel on Disposal in Salt Mines. The committee concluded that the "use of bedded salt for the disposal of radioactive wastes is satisfactory" and that "the site near Lyons, Kansas ... is satisfactory, subject to the development of certain additional confirmatory data and evaluation." Thus, it offered a favorable but conditional endorsement of the Lyons project, and it recommended research on many of the issues that troubled the Kansas Geological Survey. Nevertheless, the AEC, while acknowledging the need to resolve outstanding issues, emphasized

21. *Wichita Eagle*, June 19, 1970.

22. *Ibid.*, July 30, 1970; *Topeka Daily Capital*, July 30, 1970; Robert E. Hollingsworth to Edward J. Bauser, August 26, 1970, AEC Records, History Division, Department of Energy.

the support the document offered for the Lyons repository.²³

Kansas Geological Survey scientists were less pleased with the Committee on Radioactive Waste Management's report. Hambleton thought the committee's chair, John C. Frye of the Illinois State Geological Survey, had watered down the conclusions of the Panel on Disposal in Salt Mines. By the fall of 1970 Kansas geologists, in collaboration with the U.S. Army Corps of Engineers, had drilled two deep holes and about forty shallow holes in the Lyons area, and Hambleton prepared a preliminary report on their findings. The fieldwork and discussions with Oak Ridge experts alleviated some of his concerns but heightened others. One issue, which Hambleton described "as crucial to the safety of the repository site," was heat transfer from radioactive waste to salt. He regarded the heat-flow equations that the AEC and Oak Ridge had used as oversimplified and was dismayed that they "exhibited remarkably little interest in the heat flow problem." He feared that excessive heat could fracture rocks that sealed the salt formations and open them to the entry of water.

Hambleton expressed similar objections to the failure of Oak Ridge and the AEC to sufficiently consider radiation damage in the salt mine, which he viewed as an "extremely critical" issue. His concern was that "stored energy" in salt exposed to high levels of radiation could undergo "sudden thermal expansion" and cause small explosions that would threaten the integrity of the repository. In addition to the geological questions that needed attention, Hambleton and his staff believed that provisions for transportation of waste canisters to Kansas were "completely inadequate." Further, they complained that the AEC had developed "no contingency plans" for retrieval of the waste in the event that the repository proved to be unsuitable for permanent disposal. Ernest E. Angino, the deputy director of the Kansas Geological Survey, found it "confusing and disturbing" that the

23. Committee on Radioactive Waste Management, *Disposal of Solid Radioactive Wastes in Bedded Salt Deposits*, November 1970, printed in Joint Committee on Atomic Energy, *Hearings on AEC Authorizing Legislation Fiscal Year 1972, 2003–2031*; Panel on Disposal in Salt Mines, Draft by William W. Hambleton, July 6, 1970, box 26 (Salt Vault Project), series 1, Subject Files (Salt Vault: Atomic Energy Commission), Kansas Geological Survey Records; John A. Erlewine to Robert B. Docking, November 18, 1970, box 41 (Atomic Waste Disposal 1970), Docking Papers.

AEC appeared to take a "head in the sands" approach to retrieval.²⁴

In early 1971 the already lively debate over the Lyons repository became increasingly visible and acrimonious. The principal cause was the AEC's request for an immediate \$3.5 million appropriation for the purchase of land around Lyons and preliminary architectural and engineering work, and for a long-term \$25 million authorization for the entire project. On February 12, 1971, in a long, impassioned letter to Docking, Skubitz announced his opposition to the AEC's application for funding and to the development of the waste repository. Explaining that he had "not come lightly to this decision," he accused the AEC of ignoring the views and the rights of the state of Kansas. "The Federal Government cannot compel a sovereign State to do itself and its citizens possible irreparable injury if its officials refuse to be stampeded," he wrote. Skubitz complained that the AEC was "far from certain about the safety" of the site it proposed to use "as a dump for the most dangerous garbage in the knowledge of mankind." He asked that Docking, the Kansas legislature, and "cognizant State officials" support his position. The letter received a great deal of attention both within and beyond Kansas after the Sierra Club's Ronald Baxter released it to the press. Baxter also distributed copies of Hambleton's preliminary report of December 1970 that criticized the AEC's approach to the Lyons project.²⁵

The reaction in Kansas to Skubitz's letter was mixed, reflecting the continuing ambivalence of many state officials and citizens. Some papers, especially in Skubitz's district, hailed his effort to stop the Lyons project. The *Parsons Sun* commented that the AEC was "tangling with a buzzsaw in Skubitz," who not only was "waging a battle for Kansas but probably for the whole nation." The *Iola Register* told its readers that "Joe Skubitz appears to be one of the few in a position of responsibility in Kansas who is looking at this

24. E. E. Angino to W. W. Hambleton, September 10, 1970, box 27 (Salt Vault Conferences), and Floyd W. Preston and John Halepaska to Hambleton, October 29, 1970, box 27 (Correspondence: Salt Vault), series 1, Subject Files (Salt Vault: Atomic Energy Commission), Kansas Geological Survey Records; Dale E. Saffels to Russell Train, December 1, 1970, "Preliminary Report on Studies of the Radioactive Waste Disposal Site at Lyons, Kansas by the State Geological Survey of Kansas," December 1970, box 41 (Atomic Waste Disposal 1970), Hambleton to Patrick Burnau, August 25, 1971, box 56 (Atomic Energy Commission, Atomic Waste Repository, Lyons), Docking Papers; Hambleton, interview by author.

25. *Congressional Record*, 92nd Cong., 1st sess., 1971, 4342–4343; *Wichita Eagle*, February 17, 1971; *New York Times*, February 17, 1971.

question clearly." Others were less enamored of Skubitz's arguments. The *Wichita Eagle*, while calling for a careful investigation of the questions raised by the Kansas Geological Survey, remarked that "it would only hinder the search for answers if every Kansan got as hysterical as has Rep. Joe Skubitz."²⁶

Docking, who had won reelection the previous fall, responded to Skubitz's appeal for support by listing the actions he had taken to investigate the safety of the Lyons site. He emphasized that if the proposed repository posed "any potential danger" to the citizens of Kansas, "I will not hesitate to use all the powers of the governorship to halt the project" (emphasis in original). But Docking refused to endorse Skubitz's unequivocal opposition to the project. This brought an impatient rejoinder from Skubitz, who rebuked the governor for a "weasling [sic] statement." He made his reply available to the press and told a reporter that Docking had "tried to shunt aside his responsibilities as governor."²⁷

The AEC prepared its own response to Skubitz's letter of February 12. Seaborg reiterated that use of the Lyons site depended on the favorable outcome of scientific studies, including investigations of the issues of concern to the Kansas Geological Survey. "To date," he added, "we have no reason to believe that this important project should not proceed if authorized." Those assurances did not ease Skubitz's concerns or mollify his growing indignation. He told Seaborg in a ten-page, single-spaced letter that the key issue was the prerogative of the state to refuse to host the waste repository. He was offended by the "'big-daddy-knows-best' campaign that is at best disingenuous" and advised the AEC to recognize that Kansans were "not country bumpkins who can be taken for granted."²⁸

Skubitz's correspondence with Docking and Seaborg set the stage for hearings conducted on March 16–17, 1971, by the Joint Committee on Atomic Energy on the AEC's request for funding for the Lyons project. The Joint Committee exercised enormous influence as the oversight committee

for the AEC; both houses of Congress referred all proposed legislation relating to atomic energy to it. It also controlled the AEC's budget. Skubitz, who was not a member of the Joint Committee, led off the hearings with a lengthy statement in opposition to the allocation of funds for the Lyons project. "If this committee authorizes the funds and permits the AEC to purchase the ground," he declared, "it will have effectively denied Kansas people any choice in this vital issue." He denied that the AEC had demonstrated that the site would be safe. "We are talking about people's lives," he exclaimed. "The AEC is playing God."

Skeptical members of the Joint Committee quizzed Skubitz about the position of members of Congress from the area where the waste repository would be located. As a result, Garner E. Shriver, whose district included Lyons, and Keith Sebelius, who was likely to represent Lyons after a pending redistricting, submitted a joint statement. They urged that safety issues be further investigated, but, unlike Skubitz, they did not oppose the AEC's request for funds.²⁹

Skubitz supported his arguments about the scientific uncertainties surrounding the AEC's plans by quoting extensively from Hambleton's reports. When Hambleton took the stand, he delivered a message that distressed both the Joint Committee and the AEC. Appearing as the governor's spokesman, he announced that Docking had "reluctantly" concluded that the AEC's efforts "to minimize the problems raised by scientists in Kansas ... support fears of many Kansans that if funds are appropriated for design and site acquisition the project cannot be stopped at a later date if it is ... found to be unsafe." He urged that funding for the project be deferred until scientific studies were completed and the results evaluated. Docking's statement made clear that he had moved closer to Skubitz's position, and it demonstrated the differing perspectives of Hambleton and representatives from Oak Ridge and the AEC. Hambleton praised the Oak Ridge experts as "cooperative, candid, and forthright" but added that "when it comes to dealing with the Atomic Energy Commission ... we get evasive answers, and this is what causes the concern among most Kansans." He complained that the AEC had not provided some reports that "we requested many months ago."³⁰

26. *Congressional Record*, 92nd Cong., 1st sess., 1971, 4338–4340; *Wichita Eagle*, February 21, 1971.

27. *Congressional Record*, 92nd Cong., 1st sess., 1971, 4343–4344; *Wichita Eagle*, February 27, 1971.

28. Glenn T. Seaborg to Joe Skubitz, February 23, 1971, and Skubitz to Seaborg, March 1, 1971, printed in U.S. Atomic Energy Commission, *Supplement to the Environmental Statement, Radioactive Waste Repository, Lyons, Kansas*, July 1971.

29. Joint Committee on Atomic Energy, *Hearings on AEC Authorizing Legislation Fiscal Year 1972*, 1308–1344.

30. *Ibid.*, 1350–1357.

Milton Shaw, director of the AEC's Division of Reactor Development and Technology, responded to Hambleton's indictment. Shaw was a strong proponent of nuclear power; the trade journal *Nucleonics Week* once described him as "probably without peer in convincing someone that nuclear power is to be embraced with little or no reservation." The AEC was convinced that nuclear power would not continue to expand unless the waste disposal issue was resolved, and therefore, Shaw took an active interest in the Lyons debate. He told the Joint Committee that he was astonished by Hambleton's allegation that the AEC had withheld information. "I certainly feel we have made every reasonable attempt to keep him informed," he declared. He acknowledged, however, that bureaucratic procedures could have delayed transmission of the information that Hambleton sought. Shaw, who became emotional enough during his testimony that he was "visibly shaking," turned the tables by complaining that the AEC had not known of Hambleton's highly critical preliminary report of December 1970 until Erlewine had received a call from a *New York Times* reporter about it. Like Shaw, Floyd L. Culler, deputy director of Oak Ridge, said he was perplexed by Hambleton's comments. He assured the Joint Committee that Oak Ridge was investigating the technical issues that Hambleton had raised, including heat flow and radiation damage to salt. This was welcome but surprising news to Hambleton and his deputy, Ernest Angino.³¹

The conflicting views that the hearings highlighted greatly disturbed Senator John O. Pastore, chairman of the Joint Committee. He pointed out that the AEC had not convinced key officials in Kansas that the Lyons site was suitable, and, judging from his experience as a former governor of Rhode Island, he told Shaw that the agency could not "run roughshod" over Docking or "stuff this down his throat." Pastore suggested that instead of authorizing the full \$25 million that the AEC requested, the Joint Committee should approve only the \$3.5 million to purchase land and draw up designs for the facility. He thought this would alleviate fears in Kansas that a \$25 million authorization "would be a fait accompli." Shaw disagreed with Pastore's proposal because he preferred a "long-term

31. *Ibid.*, 1355–1365, 1446; *Nucleonics Week*, June 11, 1970; "Kansas Officials Oppose AEC on Radioactive Waste Repository," *Nuclear Industry* 18 (March 1971): 24–27.

commitment" to the project that would enable the AEC to attract "good people to work on it." He also contended that the smaller amount would delay if not sidetrack testing on specific conditions at the Lyons site. "We are at the point," he said, "that we must test in place."³²

The AEC believed that it had provided reasonable responses to the questions that Kansas officials presented during the Joint Committee hearings. It affirmed that it would sponsor research on the technical issues that Hambleton cited and would terminate work on the Lyons project if the mine turned out to be unsuitable. It argued that since it had transported nuclear materials safely for years, it was confident that the same procedures for moving waste to Kansas were appropriate. And it pledged to design the facility in a way to allow for retrieval if it ever became necessary. Those assurances did not satisfy Hambleton, who insisted that the essential research could and should be performed "before they actually go into this so-called demonstration site." The sometimes heated debates during the hearings deepened the rift between state officials and the AEC.³³

Shortly after the Joint Committee hearings, Docking commented that "AEC officials were nothing less than downright shabby" in their response to Hambleton's testimony. "They apparently thought," he added, "they could just throw their weight around and make us all play dead for them." He urged Pastore to defer funding "until safety of the project is assured" and attacked the "high-handedness of some AEC officials in their 'steam-roller' approach to moving ahead." He complained to President Richard M. Nixon about the "arrogance" and "patronizing manner" of the AEC, which, he said, had "treated as trivial the concerns of Kansans for a potentially dangerous project." Docking instructed Vern Miller, attorney general of Kansas, to explore the legal options available to the state to oppose the Lyons repository and declared that "if the only recourse to halting the project near Lyons is a lawsuit, then I would support a lawsuit."³⁴

32. Joint Committee on Atomic Energy, *Hearings on AEC Authorizing Legislation Fiscal Year 1972*, 1367–1374, 1445–1464; *Nucleonics Week*, March 25, 1971.

33. Joint Committee on Atomic Energy, *Hearings on AEC Authorizing Legislation Fiscal Year 1972*, 1344–1396.

34. Robert Docking to Vern Miller, March 18, 1971, Docking to John Pastore, March 19, 1971, and Docking to Richard M. Nixon, June 21, 1971, box 56 (Atomic Energy Commission, Atomic Waste Repository, Lyons), Docking Papers; Docking to Pastore, April 28, 1971, box 48 (Atomic Waste Disposal), Holifield Papers; *Kansas City Times*, April 15, 1971.

Congressman Skubitz heartily applauded the governor's more militant stance. He wired Docking that "as one who felt very alone for almost a year in this fight, ... I commend your position in opposing the installation of a nuclear waste dump at Lyons." The governor, despite the vocal objections he expressed, sought to keep his distance from Skubitz. He still had not closed his mind to the Lyons site if the AEC agreed to delay the project until more scientific studies were completed. His staff told reporters that Docking's recent protests were not a result of "noise from Skubitz" but reflected his long-standing position that he would act to stop the project if its safety was doubtful. The Joint Committee hearings had "confirmed for him what he suspected"—that the AEC was "not inclined to pursue tests" that Hambleton thought were necessary.³⁵

Hambleton felt the same way. He thanked Pastore for his "unfailing courtesy" during the hearings, which "relieved an otherwise difficult session." He summarized the differences between the AEC and the Kansas Geological Survey for the Joint Committee chairman. "The Atomic Energy Commission judges it has adequate information for proceeding with the radioactive waste disposal project ... and that any or all problems can be engineered or designed *out* of this 'demonstration project' when and if they appear," he wrote. "The Kansas Geological Survey holds to the view that safety should be designed and engineered *into* the project before it is undertaken." Discussions with Oak Ridge scientists after the hearings had further convinced him of the need for careful investigation of heat flow, radiation damage, retrieval, and other issues. "Father knows best," Hambleton commented about the AEC at a public meeting in April 1971. "He's like a steamroller. If you don't budge, he will roll over you and treat the effect as a negligible problem."³⁶

35. Pat [Burnau], Note to the Governor, April 5, 1971, box 56 (Atomic Energy Commission, Atomic Waste Repository, Lyons), Docking Papers; unidentified newspaper article, "Bob Threatens AEC Suit," March 19, 1971, AEC Records, History Division, Department of Energy.

36. William W. Hambleton, "Statement to the Federal and State Affairs Committee of the House of Representatives of the Kansas Legislature," March 29, 1971, box 68 (Lyons Radioactive Storage—Kansas Legislative Hearing), Accession No. 329-89-198, Robert J. Dole Papers, University of Kansas (hereafter Dole Papers); Joint Committee on Atomic Energy, *Hearings on AEC Authorizing Legislation Fiscal Year 1972*, 2229–2233; *Kansas City Times*, April 21, 1971.

Docking and Hambleton's bitter denunciations of the AEC in the wake of the Joint Committee hearings made clear that the Lyons project faced severe, if not insurmountable, political difficulties. This was a source of concern for Senator Robert J. Dole and other prominent Kansas politicians who wished to mitigate the controversy. In light of the "potential energy crisis" confronting the United States, Dole maintained that nuclear power was needed to meet the nation's power demands. Dole shared many of Docking's reservations about the Lyons proposal, but he was persuaded that the basic problem was a "lack of communication" rather than AEC indifference to the concerns of Kansas. Therefore, he advised Nixon to appoint an advisory council to assess the risks of the Lyons site in a way that would satisfy both the federal government and the people of Kansas. The council would include one representative from each of four federal agencies, including the AEC, and two representatives of Kansas.³⁷

Matters came to a head after the Joint Committee voted on June 30, 1971, to approve Pastore's recommendation for a \$3.5 million appropriation for the purchase of land and preliminary work at the Lyons site. The recommendation contained two conditions. The first was that the project would be canceled if it did not meet "reasonable standards" of safety, and the second was that an advisory council be established. The Joint Committee's action brought strong protests from Docking and Skubitz. The governor informed Pastore that he would "use all the authority of the Kansas Governor's Office to prevent the AEC from forcing this potentially dangerous project on the people of Kansas." Skubitz offered an amendment on the House floor to eliminate the funds approved by the Joint Committee. After it was defeated, he appealed for support from his fellow Kansans in the Senate. He told Dole and James B. Pearson that the proposed advisory council was a "patent fraud."³⁸

37. Ward [White] to Senator Robert J. Dole, n.d., Dole to Richard M. Nixon, April 26, 1971, and Dole to Robert Docking, June 30, 1971, box 68 (Lyons Radioactive Storage—Correspondence), Accession 329-89-198, Dole Papers; J. Frederick Weinholt to Edward E. David Jr., April 15, 1971, Subject File (Atomic Energy Commission, 1971), RG 359 (Records of the Office of Science and Technology Policy), National Archives, College Park, Md.; Joint Committee on Atomic Energy, *Hearings on AEC Authorizing Legislation Fiscal Year 1972*, 1466–1468, 2228.

38. Frederick C. Schuldt to the Director, July 19, 1971, White House Central Files, Staff Member and Office Files: John C. Whitaker, box 29 (Atomic Energy Commission, 1971), Richard M. Nixon Papers, Nixon Presidential Materials Project, National Archives, College Park, Md. (hereafter Nixon Papers); Robert Docking to John Pastore, July 13, 1971, and

Despite their differences, Skubitz, Pearson, and Dole worked with the Joint Committee to reach a compromise on the Lyons funding. The two senators agreed on legislation that provided for a nine-member advisory council that would include at least three members from Kansas. It allocated funds for the AEC to lease but not purchase land in the Lyons area. And it specified that radioactive materials could not be used for testing at the site unless they were “fully retrievable.” When the Senate passed the bill with those conditions, Docking announced that he was “very encouraged.” Although Skubitz complained publicly that Kansas had been “badly served” by its senators, he eventually accepted a slightly revised version of the legislation. The compromise amendment that Congress passed in August 1971 won editorial acclaim throughout Kansas.³⁹

While congressional and state leaders arrived at a compromise that resolved the sharp political disagreements over the Lyons site, new and ultimately fatal technical issues arose. The problem was that information provided by the American Salt Corporation of Kansas City, Missouri, indicated that water flowing underground from previous drilling in the Lyons area could reach the Carey mine in which radioactive waste would be stored. If this occurred, the water could carry radioactivity from the repository into adjacent aquifers and contaminate water supplies. The great advantage of using salt mines for disposing of radioactive waste was the dryness of their geological environ-



Kansas Senator James B. Pearson, who assumed the position upon the death of Senator Schoeppel in January 1962 and is seen here during his special election campaign later that year, worked with the Joint Committee to reach a compromise on the Lyons funding. The state's two senators agreed on legislation in 1971 that provided for a nine-member advisory council and allocated funds for the AEC to lease but not purchase land in the Lyons area. And it specified that radioactive materials could not be used for testing at the site unless they were “fully retrievable.”

ment, and a serious threat of penetration by moving water would make the Lyons location unacceptable.

The president of the American Salt Corporation, Otto Rueschhoff, first informed Oak Ridge of his concerns about the potential vulnerability of the Carey mine on May 4, 1971. He had learned only recently that the radioactive waste vault would be an “integral part of the old Carey mine,” which caused him to worry that his company’s nearby mine could “act as a conduit, transporting water from the aquifer above our operations to the vicinity of the proposed repository.” The entry points for the two mines were only about 1,800 feet apart. Rueschhoff also warned that oil and gas wells that had been drilled in the Lyons area could enable the movement of fluids from the “salt strata” to the aquifer. In a meeting with the Kansas Geological Survey on July 26, 1971, Rueschhoff reported that in 1965 the company had pumped about 170,000 gallons of water into an “injection well” near Lyons as part of its “solution mining” pro-

Joe Skubitz to James B. Pearson and Robert J. Dole, July 19, 1971, box 56 (Atomic Energy Commission, Atomic Waste Repository, Lyons), Docking Papers.

39. E. J. Bauser to John O. Pastore, July 24, 1971, box 48 (Atomic Waste Disposal 1971), Holifield Papers; Robert Cahn to Robert B. Docking, August 24, 1971, box 56 (Atomic Energy Commission, Atomic Waste Repository, Lyons), Docking Papers; *Hutchinson News*, July 21 and 25, 1971; *Wichita Eagle*, July 24 and 28, 1971; *Manhattan Mercury*, July 21, 1971; *Kansas City Times*, July 23, 1971; *Parsons Sun*, July 23, 1971; *Emporia Gazette*, July 28, 1971.



Senator Robert J. Dole held some reservations about the Lyons project but wished to mitigate the controversy. In light of the “potential energy crisis” confronting the United States, the senator believed nuclear power was needed to meet the nation’s power demands. This photograph was taken during Bob Dole’s first senatorial reelection campaign in 1974. Challenger Dr. William R. Roy, a two-term Democratic congressman from Topeka, is seated in the background. Courtesy of the Robert J. Dole Institute of Politics Archive, University of Kansas, Lawrence.

cedures. The water, rather than circulating back to a return well, had disappeared, and the company had “no idea as to where the loss occurred or where the fluids went.” This incident signaled a risk of unknown proportions that underground water could compromise the integrity of a waste repository under Lyons. Hambleton remarked that “the Lyons site is a bit like a piece of Swiss cheese, and the possibility for entrance and circulation of fluids is great.”⁴⁰

Reuschhoff’s revelations provided new impetus for opponents of the Lyons project. Skubitz announced on September 30, 1971, that the “Lyons site is dead as a dodo for waste burial.” The AEC denied that it had decided to abandon Lyons, though it acknowledged that it would begin “looking into possible alternatives,” including other salt deposits in Kansas. By that time the agency had exhausted its already meager political capital in Kansas. Docking told James R. Schlesinger, who had recently replaced Seaborg as AEC chairman, that he did not believe the agency had acted

40. Otto Rueschhoff to F. M. Empson, May 4, 1971, “Summary of Discussions with Mr. Otto Rueschhoff, Kansas City Missouri, on July 26, 1971,” box 26 (American Salt Corp., AEC), series 1, Subject Files (Salt Vault: Atomic Energy Commission), Kansas Geological Survey Records; Hambleton, *Selected Speeches*, 140–141.

“honestly and faithfully.” He made a “strong recommendation” that it “extend its search for a suitable disposal area beyond the boundaries of Kansas, and beyond the boundaries of the continental United States.”⁴¹

The AEC still refused to publicly renounce the Lyons proposal, but it eventually recognized that the site was unsalvageable, both politically and technically. In early 1972 the White House Office of Science and Technology noted that the AEC had “all but given up” on Lyons. A recent Kansas Geological Survey report had described the site as the “poorest choice” among seven “possible areas” in the state where radioactive waste might be buried in salt. A short time later the AEC announced that although it would continue to search for suitable salt deposits, it would shift its emphasis to storing high-level radioactive waste in large concrete-and-steel structures that would be placed aboveground. Skubitz remained skeptical. In response to his inquiries, he received assurances in June 1974 from Dixy Lee Ray, who followed Schlesinger

as chairman of the AEC, that the agency did “not plan to dispose of radioactive wastes in the State of Kansas” and that it intended to “manage all high level radioactive waste in retrievable surface storage.” Nevertheless, Skubitz introduced a bill in Congress three years later that would require a referendum by the citizens of a state in which a nuclear waste repository would be located. His motive, he explained, was “to prevent the Lyons, Kansas, situation from ever developing again.”⁴²

41. News Release from Congressman Joe Skubitz, September 30, 1971, Press Release Binder, Joe Skubitz Papers, Pittsburg State University, Pittsburg, Kans. (hereafter Skubitz Papers); Robert D. O’Neill to Bob Dole, October 1, 1971, box 68 (Lyons Radioactive Storage–Correspondence), Accession 329-89-198, Dole Papers; Robert Docking to James Schlesinger, October 27, 1971, box 56 (Atomic Energy Commission, Atomic Waste Depository, Lyons), Docking Papers; *Congressional Record*, 92nd Cong., 2nd sess., 1972, 4847; *Denver Post*, September 28, 1971; *Lyons Daily News*, September 29, 1971.

42. Stephen J. Gage to Edward E. David Jr., February 18, 1972, White House Central Files, Staff Member and Office Files: Glenn R. Schleede, box 6 (AEC–Atomic Energy Commission), Nixon Papers; Joe Skubitz to Dixy Lee Ray, May 1 and May 30, 1974, Ray to Skubitz, June 17, 1974, box 113 (AEC: Waste Disposal Correspondence), and Congressman Joe Skubitz News Release, March 22, 1977, box 159, folder 3684, Skubitz Papers; AEC Press Release, January 21, 1972, Nuclear Regulatory Commission (NRC) Records, NRC Public Document Room, Rockville, Md.; “AEC Shifts to Surface Engineered Waste Storage Facilities,” *Nuclear Industry* 19 (May 1972): 25; *Nucleonics Week*, May 18, 1972.

The AEC's first effort to identify a permanent site for the disposal of high-level and transuranic radioactive waste failed spectacularly. In its haste to fulfill its pledge to Senator Church and to build a repository for the growing quantities of commercial reactor waste, it not only selected a location that it eventually found to be unsuitable but also offended political leaders and scientists whose backing for the project was essential. The AEC was not indifferent to the safety of the Lyons site, but its ham-handed treatment of controversial issues often made it appear that way. Preliminary investigations of the Carey mine were promising enough for the agency to explore its advantages as a permanent waste repository. But the AEC became so focused on Lyons that it too casually dismissed the serious questions raised by the Kansas Geological Survey. Rather than taking its time to investigate scientific uncertainties and reach strongly defensible conclusions, it offered disputable assurances and pressed ahead. The AEC knew of the presence of another salt mine and oil and gas wells close to the proposed repository, but it took no concerted action to study the risks of previous drilling until after the American Salt Corporation expressed its concerns. Its refusal to fully assess the potential pitfalls of the Lyons project was an embarrassment that could have and should have been avoided by a more deliberate approach to the inherently complex problem of disposing of radioactive waste.

The AEC handled the political aspects of the Lyons debate in an equally inept manner. It was aware that the construction of a waste repository would not proceed without the support of the local community, and it was committed to addressing public concerns. But the AEC did not deal adroitly with the political issues that arose in Kansas, in large part because it tended to group critics of the Lyons proposal into a monolithic whole. It failed to distinguish between the reservations that Hambleton cited and the much more strident and intractable position adopted by Skubitz. Docking and Hambleton were open-minded about the project at the



Congressman Joe Skubitz, seen here with President Gerald R. Ford, introduced a bill in 1977 that required a referendum by the citizens of a state in which a nuclear waste repository would be located. His motive, he explained, was "to prevent the Lyons, Kansas, situation from ever developing again." Courtesy of the Joe Skubitz Papers, Pittsburg State University.

outset; they eventually became disillusioned with the AEC after it dismissed or refused to aggressively investigate the questions they raised. The increasingly harsh tone of their rhetoric after the Joint Committee hearings in March 1971 reflected their perception that the AEC had not taken due account of their expertise and responsibility for the safety of the citizens of Kansas.

Long before the AEC realized that the Lyons project was technically unsuitable, it had lost the political support it needed. Although Kansas officials were favorably impressed with the staff members from Oak Ridge and the AEC with whom they met personally, they were repeatedly frustrated and dumbfounded by the policy decisions of AEC headquarters. Erlewine's press conference in Topeka in June 1970 was the first in a series of AEC political mis-

steps during the Lyons controversy. The agency's clumsy political performance was a result of its conviction that its procedures would assure the safety of the facility and of its unseemly rush to build a waste disposal repository. The AEC paid a heavy price for its errors. The Lyons debacle received wide national attention that diminished confidence in the agency and made its search for a solution to the waste problem immeasurably more difficult. KH